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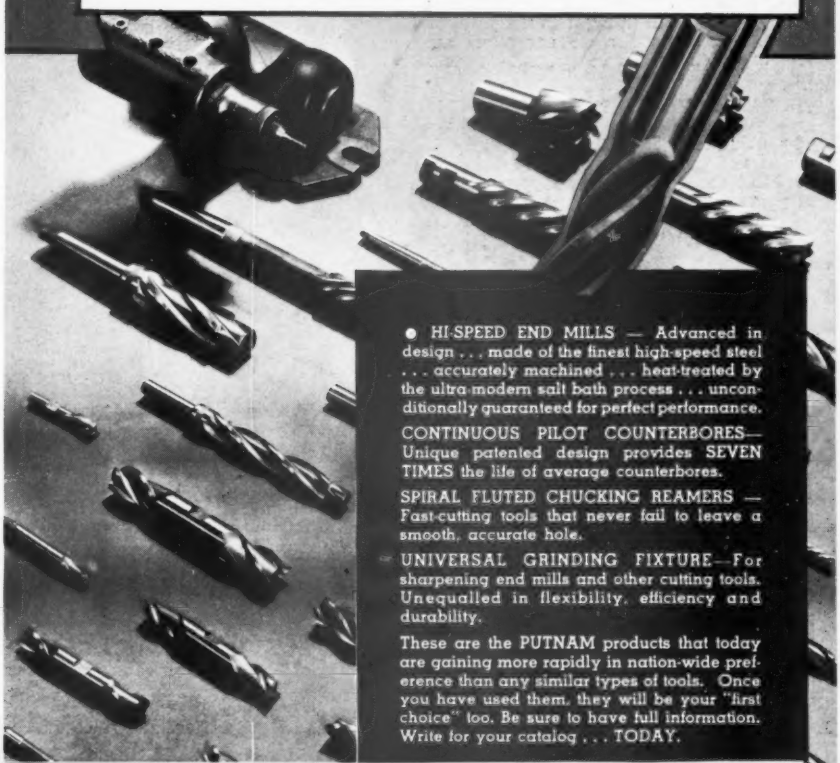

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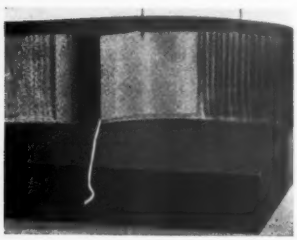

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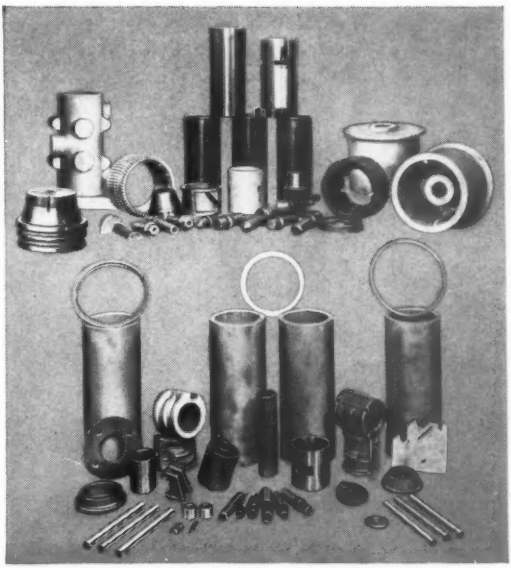

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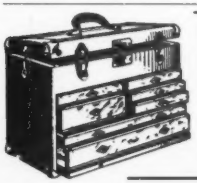

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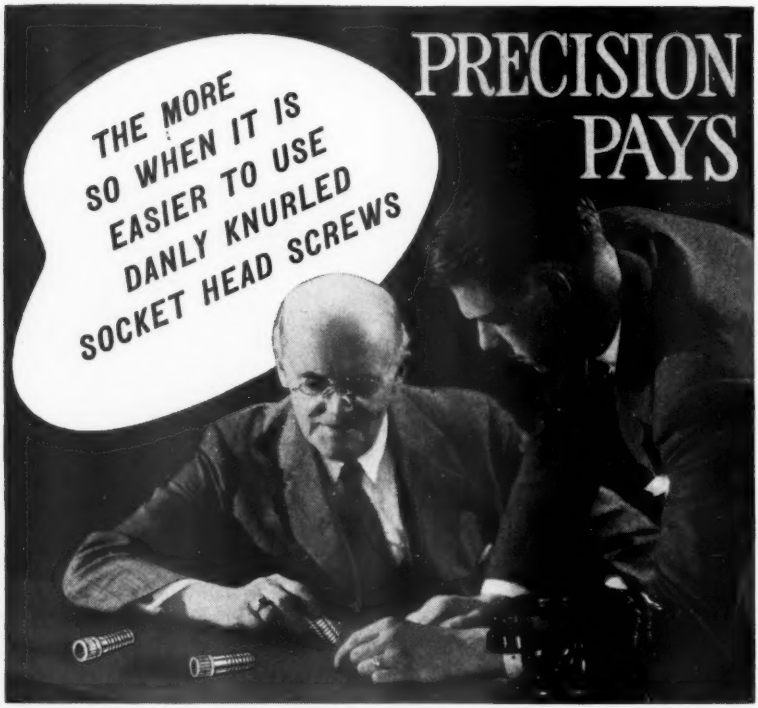

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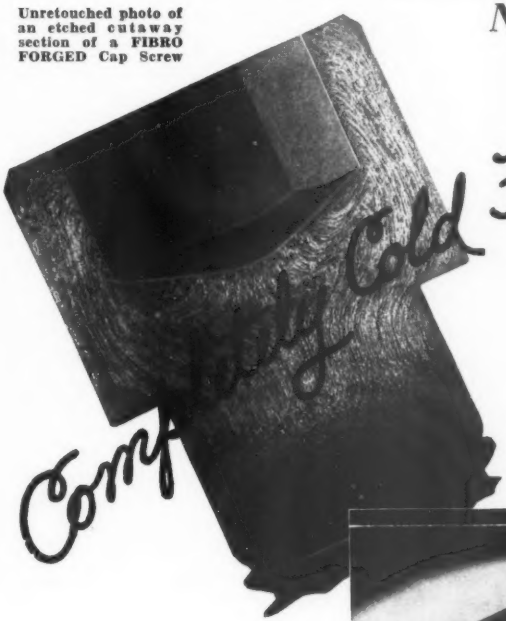

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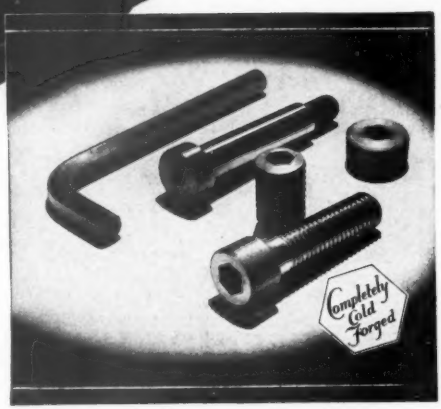

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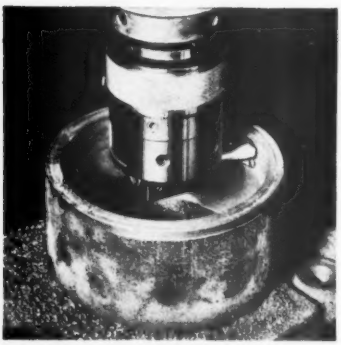

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Tool • Die • Machine **PROGRESS**

The National Tool and Die Journal

August, 1938 **Vol. 4, No. 5**

Minimizing Unemployment Insurance Contributions

By W. L. Christman

A. J. Altmeyer, Chairman of the Social Security Board, Washington, D. C., in an address before the National Convention of the American Federation of Labor at Denver, Colo., Oct. 6, 1937, said:

> "The State unemployment compensation laws differ in many respects, but they are all built upon the fundamental principle of saving up for a rainy day—in other words, pooling contributions of employers (and in a few states employees as well) to create a fund out of which to pay unemployment benefits to workers who lose their jobs through no fault of their own."

Whether or not the law succeeds in its aims is a topic which will engender limitless discussion and require considerably more space for treatment than is herein possible. The various state laws, however, are a reality; forty-eight states and the District of Columbia have created forty-nine separate and distinct laws and thereby have begun an experiment unprecedented in world social legislation. Under this hodge-podge of laws, twenty-one states and the District of Columbia began on Jan. 1, 1938, to pay out weekly remittances to workers losing their jobs; in January, 1939, the other states will have begun to pay benefits. Together with a knowledge of the law itself, certain considerations of the state law or laws under which each employer operates is highly desirable to the end that the employer may minimize his tax burden. It is suggested that employers familiarize themselves with the provisions of their own state laws.

As an example of how a state unemployment insurance law operates, we have chosen Ohio for study since its law is about as typical as any. Let us consider what may be done under the Ohio law to reduce the unemployment insurance tax.

Beginning with the year 1939, the Ohio Unemployment Insurance Fund, to which contributions have been made since 1936, will begin benefit payments to the unemployed. Anyone who has been employed for twenty weeks or more in 1938 will be eligible to receive benefits, provided he meets certain other comparatively minor requirements set up by the law. From the employer's viewpoint, the provisions of the Ohio law embody three main points:

1. Merit Rating
2. Labor Turnover
3. Sliding Tax Scale

Careful consideration of these points will mean the minimizing of unemployment taxes beginning with the year 1942, and an employer's experience prior to that date will have a direct bearing on his subsequent payments.

1. *Merit Rating*—Ohio, as well as a majority of other states, includes provision for a merit rating in its unemployment insurance law: i.e., the experience of each firm participating under the law is segregated from the experiences of the

group as a whole. Funds collected from the "Colossal Machine Co." are credited to that firm's account, and insurance benefits paid out to unemployed (Colossal's former employees) are charged to Colossal Machine Co.'s account, thus earmarking very definitely both Colossal's contributions to the fund and expenditures by the fund for Colossal's account. If an employer-firm makes a comparatively large contribution to the fund and benefit payments for its account are comparatively small, then its merit rating will be high, and the amount of tax which it has to pay will be reduced. Naturally it will be to an employer's benefit to prevent, insofar as it is legally possible, any applications to the fund for unemployment insurance, for if the applications for unemployment insurance are held to a minimum, the withdrawals from its reserve as held by the Insurance Fund are likewise reduced.

2. *Labor Turnover* must perforce be kept low in order to keep down the tax rate. As employees are laid off, the tendency will be for them to apply for unemployment insurance, and if a firm were to reduce the number of its employees in any great amount, there is not much question but that the entire group laid off would apply at the end of the three-week waiting period for their unemployment insurance. All such payments are charged to the firm's account by the Fund.

Other costs result from labor turnover, such as interviewing, hiring, etc., cost of training new help, spoiled goods resulting from inexperience. All prove the advisability of minimizing labor turnover.

3. *Sliding Tax Scale.* Beginning in 1942 the Ohio Law provides that the percent reserve in terms of the previous annual payroll of an employer-firm determines the percent of tax to be paid. Thus:

Percent Reserve	Percent Tax to Be Paid
15	1
12	1½
10	2
8	2½
Less than 8	3
0	4

The percent reserve of the previous annual payroll as maintained determines the percent of tax to be paid to the Unemployment Insurance Fund.

PRACTICAL EXAMPLE

(Based on annual payroll of $100,000)

Year	Tax in %	Tax Amount Contributed	Benefits paid	Net Credit to Reserve
1936	.9	$ 900	none	$ 900
1937	1.8	1800	none	1800
1938	2.7	2700	none	2700
1939	2.7	2700	$500	2200
1940	2.7	2700	500	2200
1941	2.7	2700	500	2200
				$12,000
Subsequent Tax is:				
1942	1.5	1500	500	1,000
1943	1.5	1500	500	1,000
1944	1.5	1500	500	1,000
				$15,000

Under the Ohio State Unemployment Insurance Law, beginning with the year 1942, a firm with a $100,000 annual payroll would pay but 1% for the ensuing year, if at the beginning of the year it had a $15,000 reserve fund. The above firm has a $12,000 reserve, pays 1.5% in 1942. On a $10,000 reserve, the tax rate would be 2%. If the firm had less than an 8% reserve it would pay a 3% tax to the Fund, while if the firm had no reserve at all, its quarterly contribution would be 4% of its payroll. The annual benefits paid are deducted from the amount of tax contributed and the net is credited to the employer-firm's account with the Fund. If the benefits are kept down, the net credit goes up and the percent tax goes down.

As a hypothetical example of how this plan operates we have indicated the experience of an imaginary firm having 100 employees with a $100,000 annual payroll. We assume that the level of pay of the employees is such that they would be entitled to unemployment insurance benefits at the rate of $10.00 per week for 16 weeks, or a total of $160.00. This money comes out of our imaginary firm's fund held by the state. In the years 1936, 1937, and 1938 contributions totaled $5400. In 1939 three people are laid off who have been employed twenty or more weeks of the previous year, and they are entitled to $10.00 per week for 16 weeks each, or a total of $480. This we have included

in our chart as $500 to make allowance for any small differences. In 1940 and 1941 the same situation obtains, so that at the end of 1941 the total reserve built up has been $12,000. Then beginning in 1942 the merit rating goes into effect, and our subsequent tax scale, as may be seen from the above, becomes 1.5% of the payroll based upon the reserve on hand at the end of the previous year. You will notice that we have on hand at the beginning of 1942 a reserve of $12,000 which is 12% of the $100,000 annual payroll paid. The percent tax for a 12% reserve is 1½. While we pay a tax of $1500 during the year 1942 we still have three people who are enjoying unemployment insurance ($10 per week for 16 weeks), and the benefits paid of $500 must then be deducted from our contribution; thus we increase our reserve for the year by only $1000.

The same situation prevails in 1943 and 1944, but at the end of 1944 our reserve comes to $15,000 and we therefore fall into the 1% bracket or the minimum amount which we have to contribute to the Ohio State Unemployment Insurance Fund. Please note that only three people in each year have participated in the insurance benefits. If 27 men were to draw $160 each, there would be no question but what a 4% tax would be paid in 1942 (27 times $160=$4320 for one year's benefit payments!)

In view of the extreme recession in business since last September, employers will be more cognizant than ever of the difficulties attendant upon any effort to stabilize employment, one of the prime purposes of the unemployment insurance laws in most states. They are also realizing that these state payroll taxes create on their part resistance to wage rate advances or, conversely, insistence on wage reductions. All of which brings conflict with unions, encounters the limits imposed by wages-and-hours legislation, and causes labor unrest. Other suggested steps which the employer may take include the transfer of employees from compensable to non-compensable classifications, the creation of more "agents" and "casual workers," and avoidance of expanding the number of workers employed.

Under the merit-rating plan, the desired percent of reserve may be maintained, also, by keeping down the annual payroll, not by depressing wage rates (a very difficult thing to do in industrial communities) but by refraining from employment expansion. Assume that our imaginary Ohio firm with an annual payroll in 1941 of $100,000 and a fund balance of $12,000 wishes to expand. As indicated above the company's tax for 1942 is $1500 (1.5% tax). However, the management contemplates expansion and the annual payroll is increased to $150,000. Since the $12,000 reserve balance is but 8% of the $150,000 payroll, the tax rate will be 2½%. (A payroll of $150,001 will increase the rate to 3%). At the 2½% rate, an annual tax cost of $3750 will replace the present $1,500. In this way the merit rating serves as an incentive not only to stabilize seasonal employment fluctuations, but to perpetuate cyclical unemployment as well.

However, even when a merit-rating system does not operate in such perverse fashion as cited, the provision of increased employment is discouraging because of the direct proportionality of the payroll tax cost to payrolls. As long as the nation is confronted with a chronic and critical unemployment problem, every avoidable obstacle or deterrent to reemployment should be avoided.

Reduction of the tax can be accomplished in four different directions: by carefully laying out policies in manufacturing, marketing, personnel, and management. Such treatment of these subjects must necessarily be very sketchy because of space limitations, but we will suggest below some of the points to consider in order to stabilize employment and reduce the unemployment insurance tax.

From a manufacturing standpoint, one of the possibilities open is semi-processing during periods of low business volume. By this we mean manufacturing up to a certain point, and then as orders come in, merchandise may be completed according to requirements. This is akin to manufacturing for stock those items for which one has continued demand during slack periods. Of course, one must always consider the cost of tying up money in finished and semi-finished goods. Thus we have the advantages of leveling production with the disadvantage of converting cash into finished goods

(Continued on page 30)

Business Reports Are Unmistakably Encouraging

◆ ◆ ◆

BUSINESS recovery is fast overtaking us. For the sixth consecutive week industrial activities statistics have moved on to higher ground until now they are actually within hailing distance of 1938 tops. The Associated Press index indicated the low point in the last week of May and a gradual but continuous rise since.

Col. Leonard P. Ayres, whose statistical findings and predictions are made public by The Cleveland Trust Company of which he is a Vice President, says: "Business has been improving for two months. Industrial production and general business activity were better in July than in June, and most of the gains have been well held, and some of them increased, so far in August . . . The present improvement in business is unmistakable, but it has not yet lasted long enough to let us know whether or not it is producing the developments that would ensure a durable recovery. One important fundamental element in its favor is that we are probably going to have this year one of the largest agricultural harvests in our history. The prices will be lower than those of last year, but nevertheless the prospective abundant harvests constitute a most favorable factor in the economic outlook."

Whether or not it will be the automobile industry which will lead us out of this recession is not yet a matter of agreement among industrial analysts but there is no denying that the last week or ten days of activity in that industry stirs enthusiasm. The Ford Motor Company has resumed production of 1938 models (not 1939), which is also true of Willys-Overland. Both indicate that this will continue until preliminaries for change-over to the new models are complete.

Chrysler is rapidly approaching production of the 1939 line, a preview for the press having been held on August 19, and present indications being that shipments of new cars will begin early in September.

The "depleted" dealer stocks of both new and used cars are undoubtedly the largest contributing factor to the resumption of production by the automobile industry. Such reports as these account for it:

Ford: Sales in July 12% over June. Company reports that the opposite is usually true, July sales averaging 7.25% less for the last four years.

Studebaker: Sales in the last ten days of July, 13% over the corresponding period of last year.

Cadillac and LaSalle: July customer delivery less than 100 cars below June.

New Passenger Car Registrations: As reported by R. L. Polk and Company these increased 5.2% over June in 21 states, while truck sales stepped up more than 35%.

Used Cars: Improvement in policies and more consistently helpful efforts and cooperation with dealers have brought about a needed thinning of used car stocks. John Love, Industrial Editor of The Cleveland Press, quotes the head of the Detroit Automobile Dealers Association to the effect that there is only a 50% of normal supply of used cars there. It is logical to believe that similar conditions prevail in other parts of the country.

Resumption of production of 1938 models by several automobile manufacturers brought new releases to automobile parts manufacturers and the general impression is that such production will continue until the change-over to parts for 1939 models.

Other good news items are plentiful. There is the upturn in the index of the

National Machine Tool Builders Association as reported elsewhere in this issue. Machine tools are capital assets, improvements in facilities to be used not only immediately but likewise for production that is expected during subsequent months and years.

And speaking of capital investments there is the report of the Youngstown Sheet & Tube Company that $17,500,000 is to be expended for additions and improvements at its Indiana Harbor plant which include a new open hearth furnace, rebuilding the blooming mill, a continuous cold-rolled tin mill and a 48-inch continuous hot-rolled sheet and strip mill; all would seem to spell confidence in the future. Notable also is the blowing-in of the new Great Lakes blast furnace of the National Steel Corporation at Ecorse in the Detroit area.

Federal reserve member banks in 24 leading cities recently reported $24,000,000 increase in one week for industrial, commercial and agricultural loans.

The United Press reports an economic possibility of first rank importance, viz., that contemplated building construction on July 1 aggregated $3,750,000,000. When it is realized that 55% of the employment drop between 1929 and 1938 was attributed to recession in the building industry and that trades and industries which contribute directly or indirectly to its activities employ some 5,000,000 persons, it is not difficult to visualize the tremendous possibilities which can accompany an increase in these building and construction activities.

In the Tool and Die Industry business is decidedly better although still spotty. Some Contract Shops have had runs of several months duration building automobile body dies. Electric refrigerator manufacturers have placed substantial orders. New tooling for production of mechanical parts is not reported in very large volume but all principal T·D·M Contract Shops do report cost estimating of an unusually large volume of machines and miscellaneous special tooling. Several insist that a comparatively small percentage of these orders which are apparently underlying the market, would step operations up to full capacity for several months.

All things considered, then, it would seem to us that the prediction is justified that much better days are ahead of us, and not so far ahead either.

GEORGE J. HUEBNER, *Editor*

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Composite Die Sections—Rings—Discs Blocks — Shafts — Hubs — Bars and Special Shapes.

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Billets and Bars of High Speed Carbon and Alloy Tool Steel.

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AJAX STEEL AND FORGE Co.

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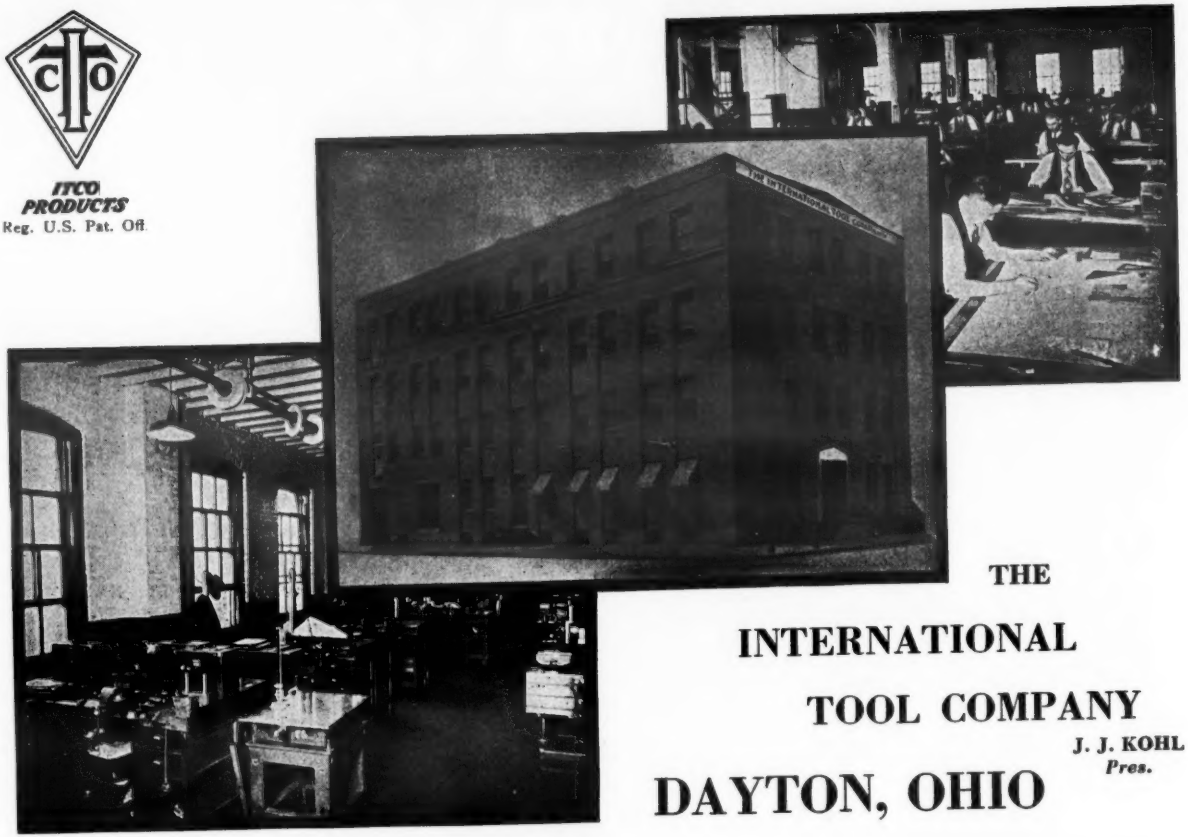

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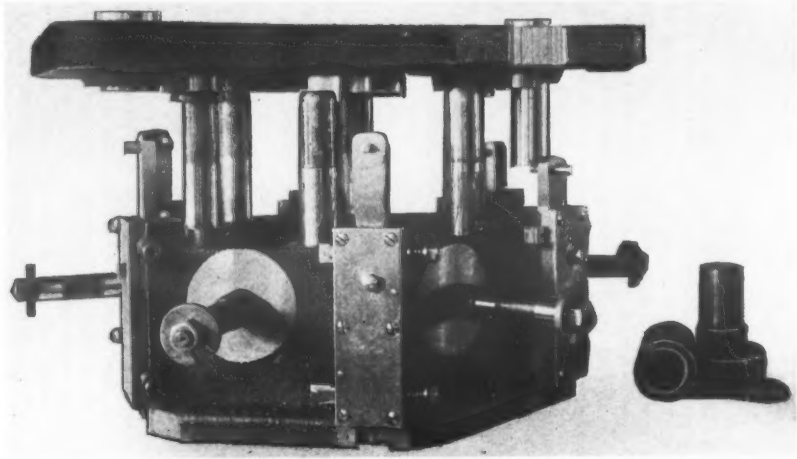
DAYTON, OHIO

Multiple Drilling Fixture



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Die Designing and Estimating

By CHARLES BOHMER

This seventh article continues the series on "Tool Designing and Estimating" as this subject is being taught to Tool and Die Shop apprentices under the auspices of the Chicago District of the Tool·Die·Machine Shop Institute in the Carl Schurz High School. The author, Charles Bohmer, tool superintendent of the Federal Tool Corporation, is one of the class instructors.

Progressive Pierce, Cut-Off and Form Dies

A DIE of this type combines all three operations by a series of progressive steps into one complete unit resulting in considerable saving in tool and operation costs. It is particularly adaptable to parts which permit simple operations, such as those having straight or coinciding ends and plain forms.

As one example let us consider the requirements necessary to produce an "L" shaped part having a perforation on the small side and square cut ends.

The component parts are the pierce and cut-off die block, stripper, gages, pressure pad, form block, cut-off and form punch and the perforator. The fact that both ends of the blank are square eliminate the necessity of a scrap cut-off, the form punch doing the shearing as well as the forming. Also the short end of the part will be formed up by the end block and the long end confined between the pad and punch. With this in mind the die is designed and constructed accordingly.

Because this type of die embodies this combination of operations, each step is in itself a complete unit. The first step in this case will be the piercing which is accomplished by the simple piercing construction which has a hardened die block, stripper, gages, punch pad and perforator. Since the perforation is on the small end of the part its location is controlled by the distance from the cut-off edge to the perforator on the die block. This distance is fixed by part specifications and cannot be changed without die alteration, therefore must be made accurately. The second and final step will be the cut-off and forming which is done by the block and pad arrangement, the punch doing the shearing or cutting-off as well as the forming. All principles of the no scrap cut-off and block and pad dies must be observed.

To assure that the die will work successfully and produce uniform parts the following are necessary precautions: sufficient spring pressure under form pad to prevent blank slippage, correct distance from cut-off edge to form block, front spring pusher to hold material against back gage, proper distance from stop to form edge, guards to prevent injury to pad, spring stripper pin in punch to overcome sticking because of oil or other causes and correct clearance between punch and die.

The above description is that of a die for a part that may be made without a scrap cut-off. Now let us consider another type of blank such as a "U" part with perforations on each side and radii ends.

To obtain this part from a progressive die it is readily seen that it is necessary to include a scrap cut-off arrangement. This must be placed between the perforating and forming stages and of such construction that parting will be done before forming, so the progressions of the die will be pierce, scrap cut-off and form.

(See next page)

Die Designing

(Continued from preceding page)

Since the part is of the "U" shape the ends or sides will be formed up by using the double block and pad design and closely following all principles of that construction. The only added precaution necessary is to provide proper stripping facilities to shed the blank from the forming punch.

Primary or first stops in dies of these two types are not necessary. A correct start may be obtained by merely extending the material slightly beyond the cut edge, which insures no error of the first blanking of the strip or sheet occurring.

As stated previously, progressive dies are no more than the combination of two or more simple dies into a series arrangement and if all principles of construction are followed in each step they will be successful to a high degree and effect considerable saving.

ALLOY HY-TEN STEELS

Immediate Shipment from Six Warehouses

ALLOY S. A. E. STEELS

Reduce your tool and die costs with *Hy-ten "M" Temper, .70 Carbon Cr-Ni-Moly* oil hardening alloy steel. Extreme toughness at high degrees of hardness. Rounds, squares and flats in stock. Forgings of all types.

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WHEELOCK, LOVEJOY & CO., INC.

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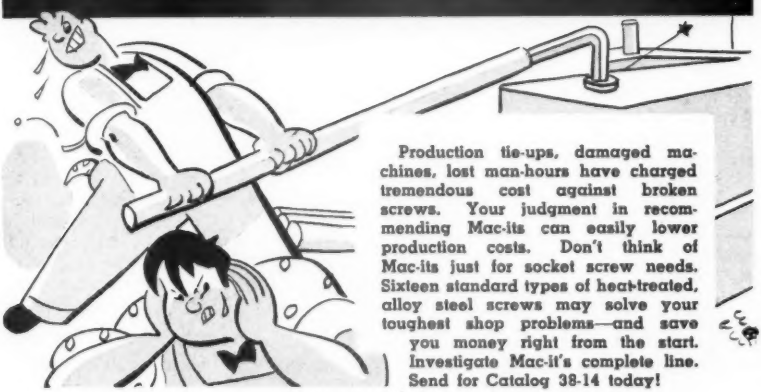
SAVE THE COST OF BROKEN SCREWS



Production tie-ups, damaged machines, lost man-hours have charged tremendous cost against broken screws. Your judgment in recommending Mac-its can easily lower production costs. Don't think of Mac-its just for socket screw needs. Sixteen standard types of heat-treated, alloy steel screws may solve your toughest shop problems—and save you money right from the start. Investigate Mac-it's complete line. Send for Catalog 38-14 today!

The Strong, Carlisle & Hammond Co.
1392 West Third St., Cleveland, O.

Mac-its PRONOUNCED "MACK-ITS" THE ONLY COMPLETE LINE OF HEAT-TREATED, ALLOY SCREWS

When you order or write about products described in TDM PROGRESS please mention the publication.

Di-Matic Automatic Screw Machine Now A Billings & Spencer Product

THE recent acquisition of the Windsor Automatic Company by The Billings & Spencer Company of Hartford, Connecticut, veteran manufacturers of forging machinery, has focused attention on the Di-matic Automatic Screw Machine, the interesting product developed by the Windsor Company.

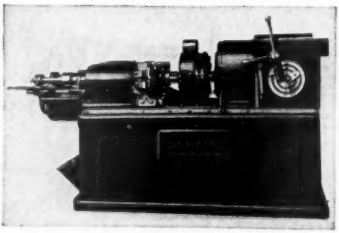
The development of the Di-matic machine may be said to have been actuated by the realization of its inventors, that industry needed an automatic screw machine so simple in design and operation that it not only would prove economical for short runs but also that its construction would be accomplished at a genuinely low first cost.

The Di-matic is, in fact, a simple automatic screw machine with two standard automatic spindles with draw-in collets, which, unlike the indexing type usually employed, are fixed. The end tools are placed in an indexing turret, the tools being brought to the work spindles alternately. A new type of indexing arm is used, actuated by a cam which allows a sufficient "dwell" of time to feed the stock in the two spindles alternately. This indexing is done easily and quickly as the weight to be turned over is comparatively small. The machine runs very lightly and easily.

The cross slide is ruggedly constructed, the base being cast in one piece with the headstock. A new type of cam action acting directly on the cross slide, eliminates back lash and assures very accurate work. The form tools are held in a frame mounted directly on the cross slide, which is in effect a permanent toolholder.

The Di-matic base is a heavy one piece casting which makes for rigidity, and provides an unusually large reservoir for chips and coolant. All operating parts are easily reached by the operator and all operations are in plain sight at all times. This makes for ease of adjustment and repair.

All high speed shafts run in standard size roller bearings and all running shafts are fully enclosed. The spindles have opposed adjustable roller front



bearings and cylindrical rear bearings which give all the speed called for in modern production methods.

The operator cannot start the machine while the crank is in position, nor can the crank be used until the feed clutch is thrown out, making for safety in operation and another safety device on the cam drive shaft stops the machine should undue stress be placed on any part during operation. The high and low speed cam disc on the gear box is in full sight at all times, and is easily adjusted by the small cams in the T slot.

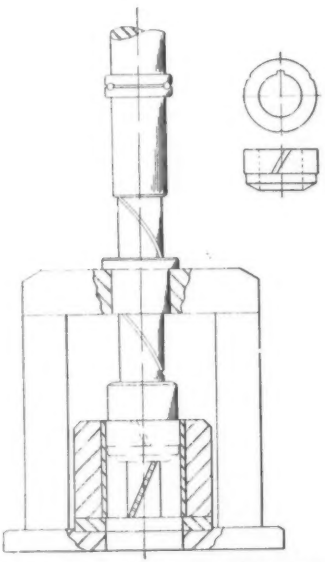
Each spindle has its own forming tool, finished-forming tool, and cutting-off tool, mounted in a rigid frame and carried by the cross slide. The spindles are mounted in adjustable roller bearings in a solid headstock which allows feeds heretofore prohibitive to indexing machines.

The end working tools, drills, turners, dies, reamers and taps, are carried in the turret which indexes in a slide mounted directly in the base on hardened and ground steel ways. The machine will perform up to seven operations at once.

Complete specifications and prices are available by addressing Department CL, The Billings & Spencer Company, 10 Laurel Street, Hartford, Connecticut.

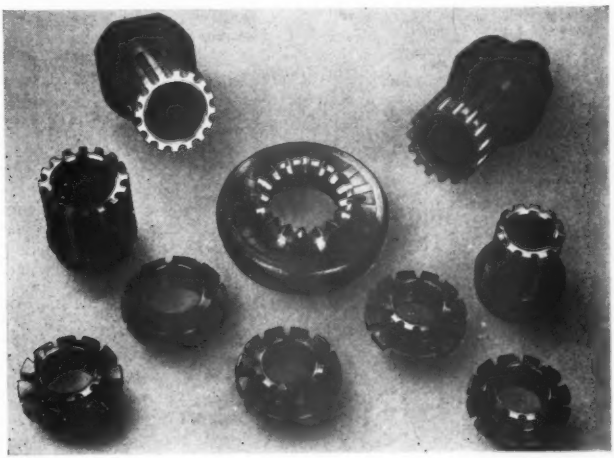
A Simple Method for Machining External Spiral Grooves

A SIMPLE but interesting solution to the problem of machining external spiral grooves such as oil grooves on guide bushings, etc., was worked out recently by Colonial Broach Company. Using a "Utility" Press, the broaches were built into the fixture while the part is pushed through the fixture by means of the ram. The latter was provided with a spirally grooved extension separated from the upper part of the ram by ball bearings. This spiral groove mates with projections in a stationary guide bushing in the top of the fixture, causing the bar to rotate and turn the part by engaging the key-way shown. Thus, while the ram moves downward the part is both pushed and turned through the fixture and broaches, dropping out through the bottom of the fixture. The ram then returns to the top of the stroke to complete the cycle.



Broaches are of simple design consisting of helical inserts mounted at an angle conforming to the desired helical lead of the groove.

★
★
★



A

PERFECT CONTOUR GRINDING JOB

We have specially developed facilities for difficult precision grinding in the building of Special Tools . . . Stamping and Coining Dies . . . Contour Rolls.

LINCOLN TOOL AND DIE COMPANY

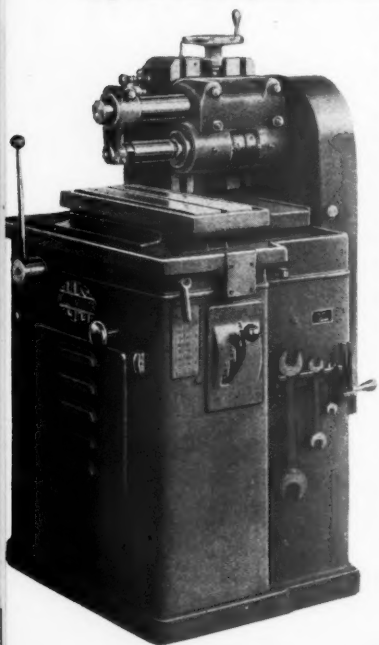
Designers and Builders 950 West Fort St., Detroit, Mich.

When you order or write about products described in TDM PROGRESS please mention the publication.

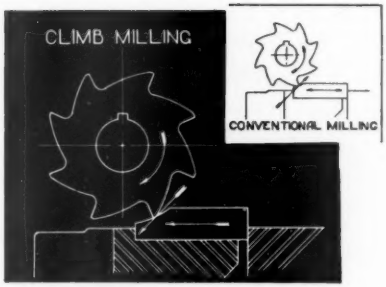
New Multi-Miller Is Versatile Machine

THE U. S. Multi-Miller is a new machine tool which has been developed especially for accurate production milling of small parts. It is a compact, light, automatic machine carefully engineered for efficient milling of many intricate parts for which large milling machines or the smaller hand millers are being used.

The versatility of the multi-miller is demonstrated in the number of types of milling for which it may be adapted. Aside from conventional production milling it may be used for climb milling, rotary milling, continuous milling of form stock, vertical milling, high speed grinding, spur gear cutting and hand milling. Because it is generally recognized that the cam method of controlling table movement permits very accurate milling, the multi-miller features a cam operated table. This makes it possible to repeat without variation a cut of prescribed depth. The cam construction permits correct table speeds at all parts of the operating cycle. Approach, cutting and return speeds are easily established to meet specific job requirements.



For conventional milling the machine can be set for fast approach, slow cut and quick return. For climb milling, the preferred cycle usually is slow speed while entering work piece and accelerated speed during the actual cutting period. Table cycles may be varied from five seconds to two minutes with standard one, two or three lobe cams. Eight table speeds are available with each cam.



The U. S. Multi-Miller is said to be the only machine designed for climb milling which may be defined as milling with the rotation of the cutter tending to clamp the work. The line drawings on this page illustrate how climb milling differs from conventional milling. It is particularly adaptable to light milling jobs because of the ease of holding the work piece as well as the better finish which results from the cleaning cut on the return stroke. In milling deep slots, chips are removed automatically. A model known as the MM-2 has been designed especially for the climb milling operation.

The cam control of the table movement is what adapts the multi-miller so readily to this operation of climb milling, the pull of the table counterweight being utilized to hold the roller against the cam contour. Particular attention has been given to eliminating the possibility of backlash when light high speed cuts are being taken.

A rotary attachment is required for the automatic milling of contour cuts. This attachment is driven from the table feed motor; the part to be milled is actually rotated about the cutter. For simpler rotary milling the table is brought into proper position by letting it drop away from the cam against a micrometer stop which provides adjustment in thousandths of an inch.

The multi-miller has been used for high speed production grinding. An in-

(Continued on page 25)

Machine Tool Buying Continues to Increase

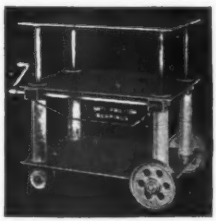
THE upturn in orders for machine tools which began in a very moderate way in June, took on more encouraging aspects in July.

Both domestic and foreign orders placed with members of the National Machine Tool Builders Association carried the index up 28% over June. Domestic buying increased 17% and foreign 38%. Equally important with this rise is the distribution of orders to a larger number of reporting companies.

A comparison with index figures of 1937 shows foreign orders approaching those of a year ago: July '38—47.8 vs. July '37—55.7 but domestic orders have quite a way to go: July '38—41.8 vs. July '37—115.4.

Move heavy dies, jigs and fixtures more quickly, economically and safely *with the*

HAMILTON PORTABLE ELEVATING TABLE



(Patented)

Eliminates costly mishaps and breakage . . . Is a labor saver because it requires only one man to handle . . . Levels and supports overhanging pieces of work . . . Safe—Indispensable—Inexpensive . . . Two Sizes: 2,000 pounds and 5,000 pounds.

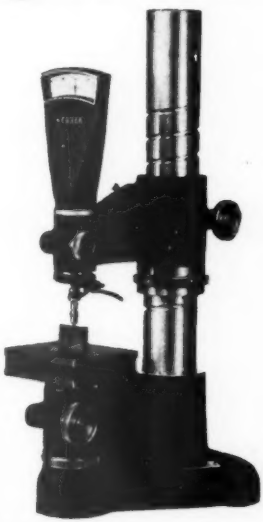
Write for circular and prices

THE HAMILTON TOOL COMPANY

222 North B Street Hamilton, Ohio

The Webber Comparator

AMERICA'S OUTSTANDING PRECISION MEASURING MACHINE TOOL



● Accurate for the finest gage work . . . mechanic operates it without instruction.

Rugged to withstand rough shop handling.

Has no gears, no levers; requires no electrical connections.

FOR TOOL SHOP USE: In conjunction with a set of gage blocks, the Comparator provides complete equipment for positive measuring within an accuracy of 20 millionths of an inch—.000020".

FOR THE PRODUCTION JOB: Set the Comparator and it stays set. Its mechanism is not affected by temperature changes.

MODEL W-8—Measuring range 0"—8" diameter.....
.....$195.00 (as illustrated)

MODEL W-6—Measuring range 0"—6" diameter....$155.00

Descriptive circulars on request

WEBBER GAGE COMPANY

2517 Vestry Avenue CLEVELAND, OHIO

Manufacturers of Webber Gage Blocks

When you order or write about products described in TDM PROGRESS please mention the publication.

Inspection By Contour Projection

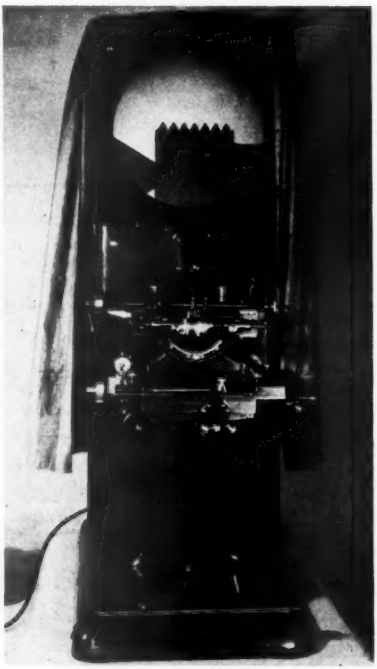
OPTICAL projection and magnification have distinct advantages for the precise measuring, comparison and inspection of numerous tools and products of industry. Among them may be mentioned: screw threads, thread plug gages, taps and dies, lead screws, chasers, hobs, thread ring gages; contour of forming tools; form and dimensions of punches and dies; surface dimensions of dies, jigs and fixtures; irregularly shaped production parts such as plain and formed stampings, knurls, face and back angles of bevel gear blanks; form of gear teeth, cams and sealing rolls; meshing action of a pair of gears; parts of which specimens are at hand, but no drawings.

The new instrument, development of which was recently completed by the Bausch & Lomb Optical Company, employs the principles of optical projection to form a shadow image of the object under magnification.

The first requirement for accuracy in a Contour Measuring Projector is that the image correspond with the object to a high degree of geometrical similarity. It is obvious that if a greatly enlarged image is to be measured to determine the dimensions of an object, the image must be correct in this respect. It is quite possible to have lens systems that are afflicted by what the optician calls optical *distortion*, which are otherwise excellent in sharpness and other characteristics.

Bausch & Lomb designers, by virtue of long and varied experience in dealing with problems of critical imagery, have succeeded in producing a series of lenses which render images with a higher degree of accuracy in this respect than any hitherto available. These projection lenses approach, in actual performance, the limits set by the basic laws of optical science.

The lens system is of a special construction, the virtue of which is that, in addition to the precision in imagery, the size of the image is independent of the sharpness with which it is focused



on the screen to such an extent that errors due to poor focusing are negligible. With *ordinary lens* systems the image varies from too small to too large (or vice versa) as the image passes from out of focus into focus again. These *new lenses* maintain the correct size of the image so long as it is near enough in focus to be measured.

These important characteristics insure precise results even under the manipulation of an inexperienced or careless operator.

The Bausch & Lomb Contour Measuring Projector is a single compact unit of the enclosed type.

The projector cabinet is divided into three parts. The upper part is a light-tight welded steel hood, within which the light beam passes to form the shadow

image on a translucent screen in front. The center of the screen is at average eye height from the floor.

The lower front compartment houses the focusing mechanism with its motor and drive, wiring, lamp, lamp housing and transformer. The front wall of this compartment consists of a heavy casting, carrying sturdy dovetail guides. Accurately fitted to these is a hollow knee-forming casting, to the top of which either a simple work table, or a cross slide table may be attached.

Mounted on top of the front wall casting is a frame, into which may be introduced any one of several available translucent screens, or a support for a plate or film holder for photography.

The lower, rear compartment is partitioned off to give convenient storage space for interchangeable screens, lenses, and other accessories. Hinged doors on both sides of the cabinet close each of the lower compartments.

The machine is built up of structural and heavy sheet steel, fabricated and welded together, making a structure of extraordinary strength and rigidity.

Passing approximately through the centroid of the knee casting, which supports the work table cross slide assemblies, is the elevating screw, connected by a gear train to a motor within the forward compartment. The motor is reversible, and controlled by means of a pair of self-releasing push buttons in the control box, located to the right and below the screen.

Recessed into each of the work tables is a piece of plate glass, so that most objects may be placed upon it, without need for other retaining means. Accessory centers, "V" blocks, screw thread holders, etc., for holding work above the glass plate, are attached in "T" slots and "V" grooves in the upper surfaces of the tables.

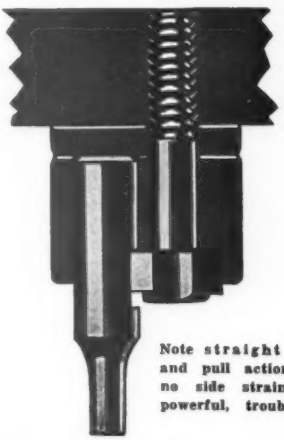
The incorporation of a horizontal work table with the beam of light travelling vertically upward past the object, insures a degree of convenience not hitherto available in similar instruments. Objects may be placed upon the glass plate without the need for auxiliary holding or locating devices.

This results in the saving of much time and expense. It permits instantaneous observation of an object without

(Continued on page 35)

NO SPRINGS! NO GADGETS!

on the Hovis Punch Retainer



Note straight thrust and pull action with no side strain—sure, powerful, trouble-free.

The Hovis Screwlock method for retaining punches is so simple that its advantages are obvious:

Positive Interchangeability and Quickest Replacement of Punches . . . Partial turn of Screwlock with standard socket wrench *really* releases punch.

The New Hovis Square Hardened Retainer is ideal for *close grouping.* With punch close to one corner, it has all advantages of both square and end type retainers . . . For *compound dies,* it permits punch mounting close to die sections.

• • •

A Hovis Record

Progressive die with Screwlock Retainers and Punches delivered 12,000,000 stampings from 13 gauge steel.

• • •

It will pay you to investigate and send for catalog . . . We make all kinds of punches.

HOVIS SCREWLOCK CO.

3129 Larned St., East Detroit, Mich

Representatives

Pennsylvania - New Jersey - Maryland - Edward R. Glenn
1438 N. 13th St., Philadelphia, Pa. Phone - STE 4658

Wisconsin - Lee Eckelman
4417 W. North Ave., Milwaukee, Wis.
Phone - Kilbourn 7513

When you order or write about products described in TDM PROGRESS please mention the publication.

Quick Action Calculator for Punch Press Operators

A CALCULATOR of value to stamping manufacturers and operators of punch presses in general may be had by addressing the Marshalltown Manufacturing Company, Department CL, Marshalltown, Iowa.

The calculator has one scale upon which the shearing strength of representative materials is indicated. By adjusting this for the length of cut or the diameter of the hole to be punched, it is possible to establish on the second scale the pressure in tons required to do the job satisfactorily. Thus it is easily established that the punching of a 5" hole in half hard sheet brass ¼" thick will require a pressure of slightly more than 50 tons. Blanking a 2" square piece from 0 to 5 carbon steel of 18 gauge thickness requires only 10 tons pressure.

A calculator will be sent gratis upon request and without obligation.

Timken Appoints Tool and Die Steel Distributors

THE Steel and Tube Division of The Timken Roller Bearing Company announces appointment of the following exclusive representatives for Timken Graphitic tool and die steels:

A Milne and Company, 745 Washington Street, New York, 109 Broad Street, Boston—the New England States, Eastern New York and Northern New Jersey; and A. Milne and Company, 21 North May Street, Chicago—Illinois, Iowa, Missouri, Wisconsin, Minnesota and Northern Indiana.

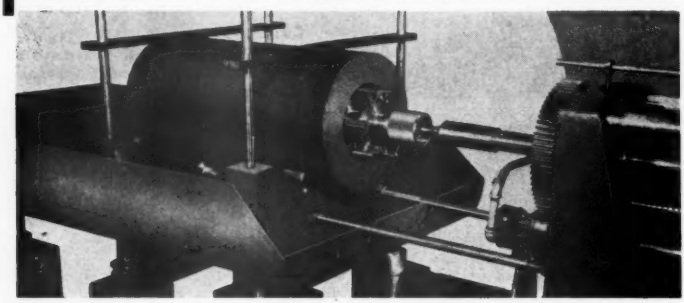
The Hamilton Steel Company, E. 131st and Taft Ave., Cleveland—the state of Ohio excepting Dayton and Toledo.

The Craine-Schrage Steel Company, Detroit—the state of Michigan and the city of Toledo.

Quality Steels, Inc., Dayton—the Dayton district.

Coulter-Sibbett Steel Company, 240 Eighth Street, Oakland, California—the northern part of California.

INVESTIGATE THIS NEW PERFECT HONING SERVICE



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Honing a hole 8¼" in diameter and 37" long in a forged alloy steel cylinder—S.A.E. 3140, Brinell hardness .534.

★

The development of the new Enterprise Horizontal Honing Machine enables us to offer manufacturers a honing service which effects savings over both precision grinding and other honing methods.

Honing, as it is done on the new Enterprise machine, assures the accuracy and fine finish obtained from lapping, but its cost is much less. It is really "lapping on a production basis."

The machine is particularly efficient for honing holes of 3" to 12" diameter in cylinders and other products as long as 5 feet. *Let us submit proposals.*

OUR MACHINE REBUILDING SERVICE is unexcelled. We maintain a large stock of production machine repair parts. Catalog on request.

ENTERPRISE MACHINE PARTS CORPORATION

Jerome Avenue at McNichols Road -:- DETROIT, MICHIGAN

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New Multi-Miller

(Continued from page 20)

teresting application is that of grinding the small slots in the cutting head of a dry shaver. The machine was equipped with a high speed grinding spindle and thirty or more grinding wheels were mounted on an arbor with proper spacers. The complete head was thus ground in one operation and the average production was 100 heads per hour. Another interesting application was for the cutting of spur-gears. Teeth were required over a definite portion of a circumference. A special fixture was used to index the number of times required to cut the prescribed depth in each blank, the machine being set for continuous operation with a five second table cycle. Two teeth were ground each five seconds.

The spindle of the multi-miller, made of a special alloy steel, heat treated and ground, is mounted in anti-friction bearings. The spindle head and corresponding bearing surface of the column are scraped and the head is held in accurate alignment by means of a dovetailed gib. The controls are grouped for the operator's convenience. The machine is equipped with an automatic pressure oiling system while a coolant pump driven by a table feed motor draws from a ten gallon tank which is an integral part of the base of the machine. A special type of quick load-vise has been designed by U.S. engineers for use with the multi-miller or with other milling machines. It is cam operated and opens or locks with a single movement of the handle.

For descriptive bulletin CL-8 write the U. S. Tool Company, Inc., Ampere, E. Orange, New Jersey.

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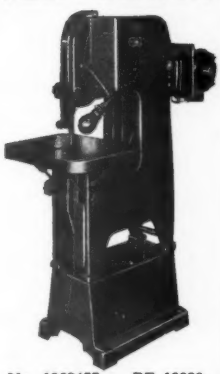
Write for detailed catalog giving full information on above as well as on other continuous motion filing machines, Metal Cutting Band Saws and Open End Band Saws.



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ACME INDUSTRIAL CO.

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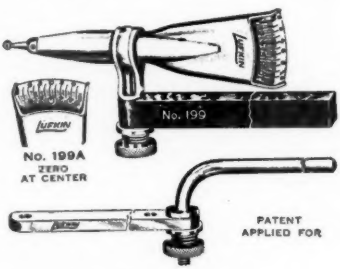
Readings Greatly Facilitated on New Indicator

A NEW Universal Indicator especially adapted for use on jig boring machines, milling machines and drill presses has been developed by The Lufkin Rule Company. Among the features which make it unusually effective for such work is the location of the reading faces. The illustration herewith shows one of these to be on the indicator's front or flat side, the other on the end or top. This end graduation makes reading possible without the use of a mirror, also provides the most convenient reading when used with surface gage and vernier height gage.



The new Lufkin Indicator, which is one unit, has a rotating head, a positive lock and with its two reading faces can be used and read in any practical position. It makes a complete revolution on its own center and also on the clamping bolt, forming practically a universal joint all locked in position by one thumb nut. The frictionally held contact point can be set at any position in a half circle. For general use a standard bar is furnished and for use with drill chucks or surface gages or with a vernier height gage there is a special attachment.

This new Indicator is distinctly a fine tool. Its housing is made of tough, rustproof metal; the contact point and all working points are hardened. The dial of No. CL 199 has zero at the extreme left and reads left to right, while No. CL 199A with zero in the middle reads both to the left and to the right. Write The Lufkin Rule Company, Saginaw, Michigan, for descriptive circular on No. CL 199.

When you order or write about products described in TDM PROGRESS please mention the publication.

The Catalog Review

Brief descriptions of current industrial literature including technical booklets and bulletins, catalogs and circulars. All may be had upon request, without charge. . . . Please use identification numbers.

NATIONAL LINE OF TOOL CHESTS.—A 4-page leaflet illustrating and describing the new National line of tool chests manufactured by H. Gerstner & Sons. Construction and arrangements are intended particularly for the tools used by tool makers, die makers and machinists, although they are adaptable for general use. The National line is popular priced but no essentials are sacrificed. Made of well seasoned lumber with leatherette or medium dark varnished finish, lock-corner construction, fitted with nickeled trimmings, a good cylinder lock with flat keys and a strong, steel center leather handle. Drawers run on hardwood supports, slide easily, have solid oak fronts and felt plywood bottoms. Removable front lid slides under bottom drawer. Different styles include chests with compartment and drawers or all drawers. Prices range from $8.50 to $12.50. H. Gerstner & Sons build all kinds of special cases and sets including those for models and special tools. Quantity prices are available. For the National line circular, write H. Gerstner & Sons, Dayton, Ohio, for TD-601.

STAMPING PRESSES.—A three-color profusely illustrated folder of Minster presses. Open back inclinable presses, single and double crank inclinable and straight side presses, adjustable bed horning presses, knuckle joint embossing presses, and eccentric lamination presses are described. Many new distinctive features such as the multi-engage spline clutch, with clutch wheel mounted on Timken roller bearings, which eliminate the necessity of replacing clutch wheel bushings, the flywheel type multiple disc air clutch having synchronizing mutiple disc air brake, which provides a smoother power to start and greater power to stop, and powerful frames that minimize frame deflection and give better support to crankshafts are also discussed. Air operated or hydraulically operated friction clutches are available on single crank straight side presses, which permit the operator to do his work in utmost safety. Write The Minster Machine Co., Minster, Ohio, for TD-602.

BRIDLES FOR AIR HORSEPOWER.—This interesting descriptive phrase aptly covers the product of the Ross Operating Valve Company. The company's catalog will be of unusual interest to manufacturers who have problems in the use of air to feed work to machines, to hold it in place, to exert calculated pressure where pressure is needed, to actuate heavy equipment, to engage and disengage at split second intervals, gears, clutches, toggles or brakes. Manufactured in a plant devoted exclusively to one item, Ross Operating Valves are used as standard or special equipment on many important machine tools and production equipment, among them being Le Blond Lathes, Nateo Boring Machines, Kingsbury Multi-Spindle Way Drilling Machines, Swift Spot Welders, all of which are illustrated. Other interesting applications include press-clutch and brake control on a Hamilton 750,000 pound press; air cylinder control which operates slides, dies and clamps on a Taylor-Winfield welder. Hand, foot and solenoid control types are described. The Norgren sight-feed, automatic air line lubricator and line of regulating and reducing valves are also described. Write Ross Operating Valve Company, 6486 Epworth Boulevard, Detroit, Michigan, for TD-603.

CONTOUR MACHINING DATA FOLDER.—For the purpose of demonstrating the effectiveness of sawing and filing by the Doall contour machining method, Continental Machines, Inc., has issued a new illustrated folder. A table listing thicknesses from ¼" to 6" of cast iron, cold rolled steel, tool steel and high chrome-high carbon steel shows the cuts which are made in each material per minute. The filing speed table indicates ounces of filings per hour from pieces 1" in thickness. Data on the selection and uses of cutting tools employed for contour machining are given and the correct sawing and filing speeds to be used on more than 40 materials, as well as the radii which can be accomplished with each of 7 widths of saw blades, are listed. Included also are price lists which became effective recently. There is an interesting skeleton photograph of Doall machine operating parts. The three pieces of literature described contain additional interesting data for present and prospective users of contour sawing machines. Write Continental Machine Specialties, Inc., 1303 So. Washington Avenue, Minneapolis, Minn., for folder and enclosures TD-604.

END MILLS AND CUTTING TOOLS.—This supplement to the Weldon Tool Company's catalog described in The Catalog Review of April, 1938, describes and illustrates new tools added to the Weldon line recently. Included are a new tang type spiral end mill with hollow ground flutes and an improved design of teeth which are also hollow ground and have cupped ends which add strength to the end teeth and prevent chip clogging. Described and illustrated also are the new Weldon spiral end mills with tapered shank for use in high speed milling attachments using a draw bar; 2 flute B & S taper shank end mills with either straight or spiral flutes; single or double-end mills with straight flute, rake tooth and double back off. Other new cutting tools described include the Weldon constant spiral die sinking cutter which cuts with great ease due to its design which incorporates very definite and positive spiral flutes from the point to the shank, and the Weldon T-slot cutter with its greater chip room, resulting in freer cutting action and less breakage. Another addition to the Weldon line are high speed steel cutoff blades made from the finest grade of material obtainable and ground all over to accurate limits. Complete specifications and prices are given. Write The Weldon Tool Company, 3000 Woodhill Road, Cleveland, Ohio, for TD-605.

SOCKET SCREWS.—A new pocket size catalog containing 40 pages of data, tables, standards and applications of value to users of socket head cap screws, hollow set screws, socket head stripper bolts and hollow pipe plugs. There is an interesting description of the patented process of manufacturing Fibro Forged screws from Chrome Nickel Alloy steel of controlled grain size. The sockets are uniformly accurate to their full depth and are of true hexagonal shape with smooth regular walls, and well defined corners, providing a snug tight fit for the wrench, and assuring evenly distributed leverage for positive set-ups. The threads supplied on standard screws conform to the American National Class 3 fit but closer tolerance can be furnished when specified. The screws are heat treated in atmospherically controlled furnaces. Each size screw is given an individual heat treatment to develop the utmost in toughness, hardness and fatigue resistance. The screws are checked and gauged during each and every operation as well as given an individual hand inspection. They are then mechanically tested on the special Holo-Krome TENTOR Testing Machine, under conditions identical to those in which they are used in industry to determine the various physical properties. It is pointed out that these exacting precautions make it possible to guarantee that every screw will give uninterrupted and unfailing performance. Holo-Krome set screws also can be supplied in Brass, Duralumin, Bronze, Aluminum, Stainless Steel, and other materials. A few of the thousands of applications for Fibro-Forged screws are illustrated and described. Stripper bolts, pipe plugs and standard and special socket screw wrenches and wrench sets are also completely discussed. Write The Holo-Krome Screw Corp., Hartford, Connecticut, for TD-606.

EXPANSION LAPS, FLOATING REAMERS AND REAMER HOLDERS.—Two circulars published to supplement the Acme Industrial Company's current catalog described in The Catalog Review, April, 1938. One circular describes and illustrates Acme Patent Expansion Laps for lapping dowel pin holes. Due to conical recess into which the lapping compound is applied while lap is in motion, the gravity and centrifugal action spreads the compound evenly over the entire surface of the lap, doing away with the bell mouth common to old style rod lapping. The second circular describes Acme floating reamers and reamer holders. "The floating drive arrangement, together with the method of grinding these reamers, produces a uniform smooth, straight hole, even in the toughest materials such as monel metal, nitralloy, chrome and 'moly' alloys," according to this description. Complete specifications are included. Write Acme Industrial Company, 206 North Laflin Street, Chicago, Illinois, for TD-607.

STEEL STAMPS AND HOLDERS.—A new circular illustrating the many styles of New Method steel stamps and holders, and discussing such features as oversize shanks for longer stamp life, exclusive thumb grip on front of stamp, knurled back to prevent slipping out of fingers and broad-round corners on shanks. New Method stamps are available in sharp, flat and open faces in Gothic, Roman, Lower C, Script, Italic and Old English style of lettering. Interchangeable type holders with either a single pin lock which locks or unlocks all the stamps with a half turn, or one with a set screw for every two characters are illustrated and described. Write New Method Steel Stamps, Inc., 149 Jos Campau, Detroit, Michigan, for TD-608.

WASHER STOCK LIST.—A new publication listing thousands of washer specifications in various materials, including steel, brass, copper, aluminum, fibre, etc. Those sizes permanently maintained in stock are so designated, thus enabling manufacturers to select for standard production as well as new assemblies the particular sizes of which they can always secure prompt delivery. Write The Wrought Washer Mfg. Company, 2100 South Bay Street, Milwaukee, Wisconsin, for TD-609.

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It has an all-around usefulness with a top performance that appeals to men responsible for production.

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DRILL JIG
COLONIAL
BUSHINGS

Unemployment Insurance

(Continued from page 11)

at a period when sales of such finished goods might be somewhat remote.

Another point in eliminating labor turnover is an integration of sales and production planning. It is entirely possible that without proper control, sales might jump ahead of production or vice versa, and consequent irregularities in production result. A study of production might very well lead to a standardization of manufacturing processes, a re-arrangement of operations, introduction of new machinery, or changes in materials handling.

In connection with a study of manufacturing, we believe it well to review the working hours put in by the factory as well as office employees. One way of stabilizing the working hours is to give vacations in slack periods. In many cases this will mean vacations will be given during the winter rather than the customary summer. It will also mean the projection, insofar as is possible, of production schedules in accordance with anticipated business. If during the period of recession, it is found necessary to reduce the working hours, it will be advantageous to keep a line on all employees as long as possible by putting into effect a horizontal pay cut (reducing everybody's working hours). The advantage of such a procedure is twofold: (1) The good men are still attached to the firm's payroll; (2) The more ambitious will find work and will not apply for benefits even after the number of hours which they are working has been reduced to such an extent that they are eligible for part-time unemployment insurance. The Ohio law is typical in not allowing an unemployed man benefits until he is working only approximately half time, or about twenty hours a week, and then such benefit is in proportion.

In the development of *marketing* policy to maintain sales volume during periods of lessened business activity there are offered several possibilities. The first, of course, is in more intensive selling effort, more calls on customers, calling on new customers, especially where business is known to be had, more intensive advertising, and the possibility of lowered prices or other special inducements

(Continued on page 38)

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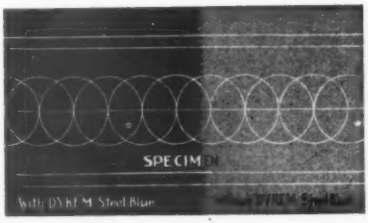
Reduce Your Set-Up Time

by Glendon H. Roberts

Set-up time on your milling machine work can be cut considerably by the use of De-Sta-Co Arbor Spacers and in these days of high hourly rates, thirty minutes payroll time saved is worth considering. These metal set-up spacers are very inexpensive and can be purchased in sizes to fit any standard milling machine arbor, in thickness from .001" to .125". Special sizes offered up to 4.000" thick. De-Sta-Co Arbor Spacers may be had with or without keyway.

The manufacturer offers to send price list and literature to anyone interested. A trial assortment, enough spacers for average use on one machine, sent post paid for one dollar, simply give arbor size when writing. Send direct to Detroit Stamping Company, 3443 Fort Street, West, Detroit, Michigan, the manufacturers, saying you read of this offer in the Tool·Die·Machine PROGRESS.—Advertisement.



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STOPS LOSSES
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Simply brush on; ready for the layout in a few minutes. The dark blue background makes the layout lines show up in a sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

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Colonial Bushings, Inc., 147 Jos. Campau Ave., Detroit, Mich.

CASTINGS— Nitri-Cast-Iron, Air and Oil Hardening Tool Steel Cast to Shape
Forgings & Casting Corp., The, Ferndale (Detroit), Mich.

CASTINGS—Strenes Alloy
Advance Foundry Co., 100 Parnell Ave., Dayton, Ohio.

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Weldon Tool Co., The, 3000 Woodhill Rd., Cleveland, Ohio.

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H. P. Preis Engraving Machine Co., 155-157 Summit St., Newark, N. J.

CUTTING MACHINES—Hand & Power
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Grob Brothers, Grafton, Wis.

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McKinney Tool & Mfg. Co., The, 1688 Arabella Rd., Cleveland, Ohio.

SALVAGE—Tool-Die & Machine Parts
Master Chrome Service, Inc., 5911 Herman Ave., N.W., Cleveland, Ohio.

SAND BLASTING
Porter Steel Treating Co., The Geo. H., 1225 Marquette St., Cleveland, Ohio.

SAW & SHEAR CUT-OFF MACH.—Automatic
McKinney Tool & Mfg. Co., The, 1688 Arabella Rd., Cleveland, Ohio.

SAWING MACHINES—Continuous
Continental Machine Specialties, Inc., 1301 So. Washington St., Minneapolis, Minn.

SAWING MACHINES—Open End
Grob Brothers, Grafton, Wis.

SCREW MACHINE PRODUCTS—Contract
Star Machine & Tool Co., 9320 Woodland Ave., Cleveland, Ohio.
Ulmer Co., The J. C., 1791 East 38th St., Cleveland, Ohio.

SCREW MACHINE PRODUCTS—Hardened & Ground
Acme Industrial Co., 206 No. Laflin St., Chicago, Illinois.

SCREWS—Socket Head
Danly Machine Specialties, Inc., 2121 So. 52nd Ave., Chicago, Ill.
Holo-Krome Screw Corp., The, Hartford, Conn.
Strong, Carlisle & Hammond Co., 1392 West Third St., Cleveland, Ohio.

SCRIBERS
Ford Motor Co., Johansson Div., Dearborn, Mich.

SHARPENING STONES
Carborundum Co., Niagara Falls, N. Y.

SHEARS—Bolt & Rivet—Automatic
Buffalo Forge Co., 477 Broadway, Buffalo, N. Y.

SINE BARS
Ford Motor Co., Johansson Div., Dearborn, Mich.

SPACERS—For Milling Machine Arbors
Detroit Stamping Co., 3443 West Fort St., Detroit, Mich.

SPACING FIXTURES
Hartford Special Machinery Co., Hartford, Conn.

SPRINGS—Die
Danly Machine Specialties, Inc., 2121 So. 52nd Ave., Chicago, Ill.

STAMPINGS
Barth Stamping & Mach. Works, W. 34th & Denison, Cleveland, Ohio.
Boehm Pressed Steel Co., The, 2235 West 63rd St., Cleveland, Ohio.
Davis Tool & Engineering Co., 6481 Epworth Blvd., Detroit, Mich.
Denning Mfg. Co., The, 1775-81 E. 87th St., Cleveland, Ohio.
Detroit Stamping Co., 3443 West Fort St., Detroit, Mich.
Modern Tool & Die Co., P. O. Box 2741, Cleveland, Ohio.
Rockford Die & Tool Wks., Inc., 1816 Seventeenth St., Rockford, Ill.
Star Machine & Tool Co., 9320 Woodland Ave., Cleveland, Ohio.
Star Tool & Die Works, 2522 24th St., Detroit, Mich.
Ulmer Co., The J. C., 1791 East 38th St., Cleveland, Ohio.
Variety Machine & Stamping Co., The, 12695 Elmwood Ave., Cleveland, Ohio.

STEEL—Alloy
Columbia Tool Steel Co., 410 East 14th St., Chicago Heights, Ill.
Darwin & Milner, Inc., 1258-64 West Fourth Street, Cleveland, Ohio.
Wheelock-Lovejoy & Co., Inc., 130 Sidney St., Cambridge, Mass.

STEEL—Carbon
Columbia Tool Steel Co., 410 East 14th St., Chicago Heights, Ill.
Darwin & Milner, Inc., 1258-64 West Fourth Street, Cleveland, Ohio.

STEEL—Chromium
Darwin & Milner, Inc., 1258-64 West Fourth St., Cleveland Ohio.

STEEL—"Cobalt"
Darwin & Milner, Inc., 1258-64 West 4th St., Cleveland, Ohio.

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STEEL—High Speed
Ajax Steel & Forge Co., 205 Adair St., Detroit, Mich.
Columbia Tool Steel Co., 410 East 14th Street, Chicago Heights, Ill.
Darwin & Milner, Inc., 1258-64 West 4th St., Cleveland, Ohio.

STEEL—Stainless
Ajax Steel & Forge Co., 205 Adair St., Detroit, Mich.

STEEL—Tool & Die
Columbia Tool Steel Co., 410 E. 14th St., Chicago Heights, Ill.
Darwin & Milner, Inc., 1258-64 West 4th St., Cleveland, Ohio.
Wheelock-Lovejoy & Co., Inc., 130 Sidney St., Cambridge, Mass.

STEEL PLATE—Rough or Machined Torch Cut Shapes
Danly Machine Specialties, Inc., 2121 So. 52nd Ave., Chicago, Ill.

STEEL TREATING—Hardening
Porter Steel Treating Co., The Geo. H., 1225 Marquette St., Cleveland, Ohio.

STRAIGHT EDGES
Ford Motor Co., Johansson Div., Dearborn, Mass.

STRAIGHTENING MACHINES
Buffalo Forge Co., 477 Broadway, Buffalo, N. Y.

TAPPING MACHINES
Buffalo Forge Co., 477 Broadway, Buffalo, N. Y.

TOOLS—Carboloy
Lyons Machine Co., 5601 Tillman Ave., Cleveland, Ohio.

TOOL CHESTS
Gerstner Tool Chests, 56 Columbia St., Dayton, Ohio.

TOOL HEAD—Universal
Precision Tool Co., The, Bridgeport, Conn.

TOOL HOLDERS
Weldon Tool Co., The, 3000 Woodhill Rd., Cleveland, Ohio.

TUBING—Tool Steel
Bissett Steel Co., The, 947 E. 67th St., Cleveland, Ohio.

VENTILATING APPARATUS
Buffalo Forge Co., 477 Broadway, Buffalo, N. Y.

WASHERS—Special
Detroit Stamping Co., 3443 West Fort St., Detroit, Mich.

WELDING
Danly Machine Specialties, Inc., 2121 So. 52nd Ave., Chicago, Ill.
Overly-Hautz Co., 1621 West 116th St., Cleveland, Ohio.
Star Tool & Die Works, 2522 24th St., Detroit, Mich.

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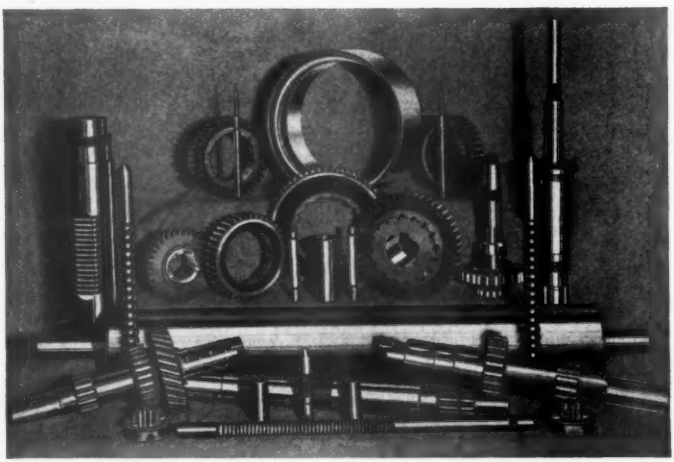

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INCORPORATED
DIVISION OF MASTER TOOL COMPANY, INC.
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Contour Projection

(Continued from page 23)

the delay and cost incident upon making or adjusting the auxiliary supporting devices necessary on instruments using a horizontal beam of light and in which the object must be supported in a vertical position.

The light source of the projector is enclosed within the cabinet. The operator is, therefore, not subjected to the least radiation of heat or stray light, and as a result a powerful light source may be used, giving a highly brilliant screen without punishment of the operator.

The handles for the operation of the cross slide table are at the front and right end of the table, at hand height. Accessories may be attached to the front and left end of the cross slide table, permitting measurement of objects up to 4" x 6" to an accuracy of 0.0001".

A catalog describing in complete detail the projector and its operation may be had by writing the Bausch & Lomb Optical Co., Rochester, New York, for Catalog CLD-27.

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BY THE ATOMIC-HYDROGEN PROCESS

- Welding of Jigs and Fixtures
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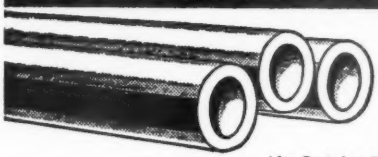
ALL DIE WELDING DONE WITH STEEL OF SAME ANALYSIS AS YOUR DIE

THE OVERLY-HAUTZ CO.
1617 West 116th St. LAkewood 3640
Cleveland, Ohio

OIL HARDENING TOOL STEEL TUBING



Substantially reduces labor costs by eliminating the expensive procedure of drilling from the solid.
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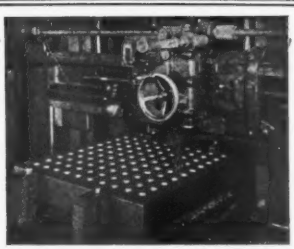
Write or phone for our copyrighted Hardness Conversion Chart



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Equipment includes:
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Designers and Builders of
Tools, Dies, Jigs, Fixtures, Special Machinery
The Hamilton Portable Elevating Table

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Unemployment Insurance

(Continued from page 30)

where business may be had but under more competitive conditions. Contests among salesmen with a bonus system or prizes for outstanding results may help to stimulate sales activity with an increased share of available business. Sometimes customer purchases are reduced because of fear of impending price drops; contracts guaranteeing against price drops might be the answer to this problem. Another way of encouraging purchases during periods of recession is deferred billing, longer credit terms and higher credit limits. Sometimes it is possible to add to the line in order to increase sales. However, all of these possibilities must be reviewed carefully and their respective advantages and disadvantages weighed.

Personnel policies can materially reduce labor turnover. In the first place, employees should be selected with care; complete information should be obtained concerning prospective employees. Face to face discussion concerning the prospect with his various references will usually obtain information otherwise not to be had. In the case of key employees this is especially important.

The cost of training new employees can not be avoided. New employees can be trained in groups through apprentice systems and some sort of schooling, and information concerning company practice and policies imparted in that fashion. However, individual analysis of each employee and his job will render the employer greater information and will show up the questionable man more quickly. As a check, one may ask: What does the job need; What does the man have; What does the man still require? In the case of a questionable employee it is probably better to let such help go or try to find another job for him. Foremen and supervisors are particularly important. Employees who are sufficiently flexible to take several jobs may be transferred from department to department if work in one department is heavier than that in another.

In connection with the production planning mentioned under manufacturing policies, consideration might be given to budgeting employee requirements of various departments. All of this can perhaps be best brought about through a centralized personnel department which would act as a clearing house for the requirements of the several departments and help maintain company policies.

Management itself can make several decisions which will stabilize employment. First, it can authorize maintenance work during periods of inactivity. This means laying out money, but in the case of necessary maintenance such work might best be undertaken during periods of business recession rather than waiting until men are needed for peak production. Second, make available to the supervisors and foremen what this unemployment law means. Advise them of its implications and ramifications. If additional employees are required during the summer months, hire college juniors or sophomores, for employment of such students does not increase the liability of an employer for unemployment benefits when such people lose their jobs. A possibility might be to exchange employees with other firms if the business peaks of the two firms come at various times. Finally, in management's attitude the employees should be thought of as individuals, and the employer should know each man's qualifications. Thus it is possible to fit the individual to the job, eliminate dissatisfied help and thus increase productive efficiency.

Some of the foregoing suggestions may cost as much or more than the unemployment tax saved by such alternate action. If at any time this be the case, the answer is—pay the tax. The increasing tax burden together with such legislation as the recently enacted wages-and-hours bill means that management will have to look more and more sharply for profits. The marginal producer of today may well be among tomorrow's list of commercial failures if his management cannot save sufficient to pay for this extra burden which accrues so long as wages are paid.

RICHARD MOULE ARRIVES

On July 20, Tom Moule, Advertising Manager of The Ex-Cell-O Corporation qualified again for the ancient and renowned Society of Proud Fathers by virtue of a new son, an eight pound boy, Richard. Mother and baby are doing fine, and the father is reported greatly improved.

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Another Example

OF OUR

Planned Production Engineering Service

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THIS time we have applied our principle of the continuous rotary type machine to a foundry product. Gates of small alloy castings are automatically broken apart at the rate of 8500 per hour.

* * *

The designing of special cost-reducing production machines is a highly specialized branch of mechanical engineering. Experience unquestionably is one of the most important requirements. Our experience includes such a large and varied list of product applications in different industries that we can almost invariably base our study upon a similar previous production problem successfully solved.

Perhaps specially designed machine equipment will reduce your product cost. Why not discuss the possibilities with us?

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We regularly build automatic machines for continuous milling — drilling — polishing.

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The Value of Inspection

A corner of our Inspection Department

Inspection, according to Mr. Webster, is: "To view closely and critically, especially so as to ascertain quality or state, to detect errors, etc.; to examine, scrutinize, investigate . . ."

Much of the *quality* of a die, tool or machine, in fact of any precision-built product, is hidden away in workmanship, parts and materials. *Continuous, close* and *critical* inspection therefore is a vital requirement, and in our shop this is assured by a modern well-equipped Inspection Department. Master gage blocks, comparators, working gages of every description are used to make dimensional checks and all steels must pass our own hardness tests. This may be more costly for us but it builds into our tooling products that *quality* which guarantees product accuracy and makes for longer trouble-free production runs. Thus we win and retain the valued confidence of an ever-increasing group of customers.

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